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CRITICAL NOTES ON THE SPECIES OF HALIPLIDÆ OF AMERICA NORTH OF MEXICO WITH DESCRIPTIONS OF NEW SPECIES.

BY CHRIS. H. ROBERTS,

NEW YORK, N. Y.

The writer has for several years been amassing material and studying the structure of these very interesting water beetles with the intention of writing a review or synopsis of the family.

The recent publication of Mr. Robert Matheson's paper[1] perhaps makes such a work unnecessary, at this time, and I will therefore confine myself to notes, critical or otherwise, on the previously recognized species and the description of others not seen, or overlooked, by previous authors. In the study of the family I have examined, individually, literally thousands of specimens and have had before me, with few exceptions, anywhere from six to hundreds of specimens of each species noted.

I have had before me examples of all the species described up to the publication of Mr. Matheson's paper, and all of his newly described ones with the exception of *Haliplus deceptus, mimeticus* and *vancouverensis,* which three species I have not seen, or am unable to recognize.

The first two should not be hard to determine, with the aid of his plate of elytra, but the description of *vancouverensis* is so indefinite that it would fit several species when all reference to color markings,

[1] JOURNAL OF THE N. Y. ENT. SOCIETY, Vol. XX, page 156, September, 1912.

or the lack of them, the character of the punctuation and the form and sculpture of the metasternum is left out, and no comparative notes are given. Unfortunately I have not been able to see his types.

The structural characters most useful in separating the species are the form and markings, such as depressions, margins, etc., of the prosternal process, metasternum and coxal plates as well as the shape and structure of the parts of the upper surface of the body. In fact the structure of the under body seems to vary very little among individuals of a species, which fact was not at all appreciated by Mr. Crotch, as shown in his "Review," and little made use of by Dr. Leconte.

If the mid-metasternum of a species is margined, and that margin extends backwards so as to reach, or approximate, the anterior suture of the antecoxal piece and in another species the margin does not reach more than half way to the suture, the two species could be almost certainly separated by a reference to that one character alone. So also can the shape of the coxal plates, whether rounded or angulate, be used with confidence.

Punctuation, both on the upper and under surfaces, especially as to whether the punctures are large and shallow, or small and deep, is quite characteristic and constant.

The study of large series of specimens of species easily recognized from some decided structural character has led me to value maculation rather highly as an aid in determining species. While spots may be dilated, sometimes even to the point of coalescence, or lines lengthened, or either of them diminished almost to obliteration, the character of the color markings, that is whether lines or spots, or even the pattern, will usually be indicated.

I do not mean to imply that some species do not mimic others rather closely in pattern of maculation, but in that case, when structural differences are found, some modification of the markings will be observed which, while perhaps slight, will be found constant.

Variation in color markings along the above lines is not at all uncommon in the species of *Haliplus,* but in *Peltodytes* the maculation is remarkably constant and may be almost absolutely relied upon, as also may the color of the hind femora.

In the latter genus if one specimen has seven spots on each elytron and another six, or if one has a sub-humeral spot and another has

none, you may be sure, in either case, that you are dealing with two distinct species and structural characters will be found to support the varied maculation.

The males can always be separated from the females, even when determining the smallest species, by the form and vestiture of the front and middle tarsi.

In the males the first three joints are shortened and thickened, more or less pedunculate, or produced, in many species, and are evidently pubescent beneath, while the females have the joints simple and more slender.

These male characters vary among the different species but are not very useful for specific definition, except in a few instances where the modification is out of the ordinary, as they are entirely comparative as to degree of thickening or production of the joints. For the same reason I do not find the emargination of the labrum, mentioned by Mr. Matheson, of much value in specific identification. An analysis of his descriptions shows, in *Haliplus,* one species as "truncate," seven "slightly emarginate," five "emarginate" and one "strongly emarginate"; in *Peltodytes,* one "scarcely emarginate" and seven "not emarginate." This leaves too much to individual estimation and view point to be of value, and might lead to confusion unless used in comparing nearly related species as emphasis to other characters, and even here the differences are too slight, so far as my observation goes, to be appreciated.

In the following paper are described one new species of *Brychius,* eleven of *Haliplus* and six of *Peltodytes,* bringing the total of our described species of Haliplidæ up to forty-three. I have no doubt but that careful collecting, especially in the west and south, will bring to light other undescribed species.

In concluding these prefatorial remarks I wish to acknowledge my debt to the late Frederick Blanchard.

We examined and studied together the Leconte types and other material at the Cambridge Museum, and I shall not soon forget the week spent at his home in the study of his specimens, aided by my compared specimens and the notes made on our museum trips. His enthusiasm was contagious and his interest unflagging as my study progressed, and his habit of close observation made his suggestions, and always frank criticism, of great value to me. My acknowledg-

ments are also due to the authorities of the United States National Museum, having in charge the collections of insects, for the loan of all its material, to Mr. Charles Schaeffer, for the loan of specimens collected by him in Texas, and to Messrs. Chas. W. Leng, John D. Sherman, Jr., and J. B. Wallis, for the use of their specimens on the broad principle of "help yourself to anything you want." The careful collecting of Mr. J. B. Wallis, of Winnipeg, Manitoba, added two new species to our known fauna, and his liberality large series of specimens to my cabinet where, in several instances, my material heretofore had been meager.

BRYCHIUS Thomson.

In describing this genus the use of the expression "thorax quadrate" seems to me inappropriate as far as our species are concerned and also as to the *elevatus* Panz., the only European species I have.

The thorax, while not obliquely narrowing from base, is decidedly transverse, being nearly, if not quite, one half wider than long.

Brychius parvulus new species.

Oval, strongly convex laterally and longitudinally, pale olive green.

Size: length 2¼ mm.; width 1¼ mm.

Head with the apical half pale yellow in color and faintly rugose and the basal half infuscate and finely punctured; broad between the eyes; eyes round and quite prominent; antennæ pale yellow. Pronotum transverse; sides slightly sinuate and finely margined; not obliquely narrowed towards the apex; depressed at base between the depressions, or striolæ; striolæ deep and short, not extending over one third the length of pronotum; finely, closely and evenly punctured, except a narrow space each side where the punctures are more scattered; an infuscate area between the impressions, darkest at base, gradually fading to apex and leaving the sides pale yellow.

The elytra, viewed from the side, are convex, decurved at about two thirds from base, strongly convex laterally and immaculate; punctures of the striæ fine, not deep and rather irregularly placed; some of the punctures darkened, but not sufficiently so or regularly enough to produce stripes; apices gradually rounded and obtusely angulate at suture.

The under surface of body and legs are uniformly pale yellow, except the last abdominal segment. Prosternal process broadest at base, very gradually narrowed to the front coxæ, and beyond them suddenly and strongly constricted; flat; impunctate; without margins.

Hind coxæ broadly rounded and without sign of exterior or sutural angles; punctures shallow and not closely placed.

Owing to the manner in which the specimen is mounted it is impossible

to see the metasternum and, being an unique, I have not the temerity to remount it.

One specimen, a female, from San Mateo Co., California—"Baker."

Type from, and deposited in, the collection of the U. S. National Museum, Washington, D. C. This is a very interesting species, which would scarcely be taken for a *Brychius* at first glance, its form reminding one very much of a small *Berosus*, especially when viewed from the side.

Haliplus connexus Matheson.

Mr. Matheson has very well separated this species from its nearest ally, *fasciatus* Aubé.

In addition to the characters mentioned by him I may add that in *connexus* the mid-metasternum is more broadly impressed each side, almost lobed, and the margin is more abbreviated, not reaching the suture of the antecoxal piece, as is the case in *fasciatus*. The punctuation is more shallow throughout, especially so on the coxal plates.

The males have the front and middle tarsi more slender, the joints shorter and proportionately more pedunculate.

Both species have the apex of pronotum finely margined each side, obsolete at middle. This margined apex separates the two species from the *triopsis* group as well as the absence of any anterior black spot.

Haliplus punctatus Aubé.

From the specimens so named I have seen in collections there seems to be a misconception as to what this very distinct species is. I may, therefore, be pardoned for giving a translation of Mr. Aubé's French description, as follows:

"Length 3¾–4. Breadth 2⅓ mm.

"Oval, rounded, convex, slightly depressed about the shield and ferruginous. Head quite strongly punctured, antennæ and palpi testaceous.

"Thorax ferruginous, with a round black spot at the middle of the front margin: one and one half times as wide as long, strongly emarginate in front where it is narrower, sinuate at base the sides of which are slightly oblique, the middle of the base prolonged in a point upon the elytra; sides rectilinear and oblique, front angles acute and strongly diminished, hind angles almost right angles.

"Thorax covered with large, deep punctures except the center of the disc which is smooth within a small limit.

"Elytra oval, wider in front than the base of the thorax, very much dilated and then narrowing quite abruptly up to the extremity which is slightly oblique, terminating in a point. Elytra with ten rows of large, deep punctures, especially large and deep in front where the striæ are confused; near the suture a line of shallow punctures close together with a few similar punctures widely separated in each interval. Elytra with six black spots quite well defined, often confluent, arranged as follows: one outside a little behind the shoulder, another a little farther inside and behind the preceding more or less confluent with the suture; two more on the same horizontal plane about two thirds the way down the elytra; finally back near the extremity are two others arranged slightly obliquely from the outside towards the inside and from below above, of which the internal unites with the suture. The suture is also black terminating in a large lance head; the base is also largely black for five sixths of the way from the suture.

"Often all the spots, suture and base have points of contact of more or less extent.

"The reflexed portion, under side of the body and feet are ferruginous.

"Posterior coxal processes with large, deep punctures."

Mr. Aubé calls attention all the way through to the deep and coarse punctuation, ferruginous color and liability to confluence of the spots. In examining about one hundred and fifty specimens of this species I find the tendency to confluence so strong that in a majority of cases the species has a trifasciate appearance, and in no instance have I seen a specimen where there were not some points of contact in the maculation.

This character, its strong, deep punctuation and its ferruginous color, taken together, should readily separate it from *triopsis*. All the specimens I have seen are from Florida, Texas and Louisiana.

Mr. Matheson certainly could not have had this species before him in making a redescription. It does not fit the species, nor does his plate correctly represent it; but he more nearly characterizes the species described farther on as *ochraceus* and which is found in the middle and eastern states.

Haliplus suturalis new species.

Oblong-oval, convex, fulvous.

Size: length 3¼–3¾ mm.; width 2–2¼ mm.

Head very finely and closely punctured, except a small space at vertex which is impunctate; eyes large; antennæ testaceous. Pronotum rather finely and evenly punctured; punctures coarser than those of head, but not so coarse as the elytral punctures; a small round black spot at center of anterior margin.

Elytra broadest just below the humerus, gradually rounded and narrowing to external apical angles, which are obtuse; apices slightly oblique, not den-

ticulate, interior angles acute; striæ composed of closely placed punctures, fine and shallow towards the suture, coarser and deeper at the middle and sides and which are confused near the base; sutural interval with a double row of very fine and closely placed punctures and the other intervals with single rows of fine punctures not so closely placed; maculate with eight small spots on each elytron placed as follows: one centrally on the base, one subhumeral, one median and below this one a sublateral, a submedian and a sutural one placed nearly horizontally, the last coalescent with the suture, below these three two more, the one placed near the suture and the other obliquely below near the lateral margin; the base is very narrowly black from suture to just beyond the basal spot; the suture narrowly black for its entire length and the apices tipped with black in the usual way at the sutural angle. Under surface of the same color as the upper with an infuscate patch about the front and middle coxæ, and the posterior margins of the abdominal segments also infuscate.

Prosternal process with the sides parallel for nearly their entire length, slightly excurved near the declivity, quite strongly margined laterally and with the apex finely margined; slightly convex and finely, densely and evenly punctured between the margins.

Mid-metasternum margined for about two thirds the distance to the suture of the antecoxal piece with a few scattered punctures between the margins.

Hind coxæ evenly punctured with shallow medium-sized punctures, broadly rounded from exterior angle to suture where the angles are obtuse.

Male front and middle tarsi with the second and third joints shortened and slightly produced apically; claws long and slender.

Male and female types from Albuquerque, New Mexico (H. F. Wickham) are in my collection.

Other specimens before me are from Shovel Mt., Texas (F. G. Schaupp), and from "Tex." (U. S. Natl. Mus. Coll.).

In a dozen or more specimens there is scarcely any variation except that in some female specimens, the interior subapical spot is joined to the suture by a narrow point or line.

At first I hesitated to describe this species, thinking it might be Mr. Matheson's *deceptus;* but even taking into account his very vague description there seem to be several decided points of difference. The smallest specimen of *suturalis* is not as small as his *deceptus;* the color is not pale yellow; the spot on pronotum is not rufous; a Carl Zeiss, 27, hand lens shows no denticulation to the apices of elytra, nor is the exterior angle so acute as represented in the cut on his plate of elytra. *Suturalis* has no close relationship to either *borealis* or *lewisii,* from which species Mr. Matheson separates

by comparison his *deceptus,* could not be confused with them, but belongs to the *triopsis* group.

Haliplus leopardus n. sp.

Broadly oval, convex, ochraceous.

Size: length 4–4¼ mm.; width 2½–2¾ mm.

Head finely punctate, more closely towards the front, vertex nearly smooth a few punctures only appearing; eyes large, round and moderately convex; antennæ color of head and thorax.

Pronotum evenly and closely punctured with deep, but not coarse, punctures; not depressed at base; a large black spot placed centrally on the front margin.

Elytra broadly oval, widest just below the humeri and narrowing very gradually to the exterior apical angle; apices slightly oblique, not at all sinuate, finely denticulate and with the angles obtuse; maculate with seven large, uneven black spots situated as follows: one subhumeral, one centrally just above the median line, three submedian placed nearly horizontally and equidistant from lateral margin to suture, the sutural one coalescent with margin, two subapical, the exterior near side margin and the interior obliquely above, which latter is elongate and connected by an arm to the suture; base broadly margined with black from suture to very near the lateral margin and produced downward upon the elytra at center; suture broadly black from base to median coalescent spot and from it more narrowly to apex, terminating in the usual triangular spot; striæ composed of rather large, shallow punctures, smaller and less deep near the suture; sutural interspace with a double row of small punctures and other interspaces with single rows of very fine ones.

Under surface of the same color as upper, with the joints of legs and posterior margins of abdominal segments infuscate.

Prosternal process very slightly convex laterally, finely, evenly and not deeply punctured, parallel from base to apex, where it is narrowly margined; side margins thick, rather flat and distinctly punctured. Mid-metasternum margined for about two thirds its length, the anterior third of which is much thickened and somewhat arcuate; finely and deeply punctured between the margins, except a small space at center.

Hind coxal plates with the apices broadly rounded from exterior angle to apex and slightly sinuate from there to suture, where the angle is rectangular.

Middle trochanters in both male and female deeply punctate on lower side.

Male front and middle tarsi with the joints thickened but not at all pedunculate; claws of both male and female noticeably shorter than those of other species in the *triopsis* group.

Types, male and female, from Egremont, Mass. (Roberts), in my collection.

I have seen specimens from Tyngsboro (Blanchard) and Cam-

bridge (U. S. Natl. Mus.), Mass., and from N. Y. City and Riverside, Conn. (Roberts).

Thirty odd specimens before me show little tendency to variation in size or markings. When any coalescence of the spots appears it is by lines extending perpendicularly, following a stria, rather than transversely with a tendency to form bands, as in *punctatus.*

The species *triopsis, punctatus, suturalis* and *leopardus,* with perhaps *deceptus,* form a natural group from the similarity of structural characters and the presence of the black spot on anterior margin of the pronotum. As in *fasciatus* and *connexus* many of the specimens show more or less distinct traces of two spots situated each side on base of pronotum. *Leopardus* should at once be separated by its large size, large spots, more rotund shape and the punctured trochanters, *suturalis* by its color, more orange than lemon yellow, its small spots and size, the very narrow black border to the suture and base of elytra and absence of denticulation to the apices.

Large series of both *triopsis* and *punctatus* show considerable variation in size, the former ranging from 3½ to 4 mm. in length and from 2 to 2½ mm. in width while the latter varies from 3 to 3¾ in length and from 1½ to 2 in width, *punctatus* being rather the smaller and more slender of the two.

In *triopsis* the pronotum is distinctly impressed at base while in *punctatus* it is not, or scarcely perceptibly so.

The elytral punctures of the former are coarse and shallow, while in the latter they are deep and closely placed.

In *punctatus* the prosternal process is more sharply margined and these margins are more decidedly roughened by the deeply and closely placed punctures, while the front or apical margin is quite distinctly and sharply angulate at middle; margins of mid-metasternum more sharp and fine and not so widely separated; denticulation of apices of elytra finer, almost obsolete; hind coxæ not so broadly rounded towards the suture, the interior angle being quite sharp.

The punctuation in *punctatus* is deeper and more closely placed all through; the color ferruginous, not testaceus or fulvous; the spots large and more or less dilated and frequently so confluent as to form irregular bars across the elytra. While *triopsis* is widely distributed, being found almost everywhere east of the Rockies, *punctatus* seems only to be found in the south, being quite common in Florida.

Haliplus cribrarius Lec.

There are at least two, possibly three or four, species mixed in collections under this name, and in order to help to distinguish it from the others I call attention to some characters not mentioned by either Leconte, Crotch or Matheson.

The prosternal process is not merely flat and without margins, but it is broadest at base, slightly narrowing to just beyond the front coxæ, where it is strongly constricted, and then broadens over the declivity, which is not sharp but gradually rounded; beyond the constriction it is finely, but distinctly, margined at the sides and across apex. On account of the gradual rounding of the process towards the front, instead of being sharply declivous, the apical margin is carried well forward and might be overlooked. The mid-metasternum is tumid between the middle coxæ and behind them very deeply depressed, and very finely and briefly margined.

Hundreds of specimens examined show scarcely any variation in the above characters, or in the black markings, except as to intensity, but in size there is considerable of a range. In one netful I have taken males measuring from 3½ to 5 mm. in length and from 2 to 3 mm. in width, and females vary proportionately.

Specimens I have seen are from Manchester, Vt. (Roberts); West St. Modist, Lab. (E. Doane); Randolph, N. H. (Sherman), and Eagle Harbor, Lk. Sup. (Schwarz).

Haliplus nitens Lec.

I entirely agree with Mr. Matheson that this species is not "merely a pale variety of *cribrarius*," as stated by Mr. Crotch in his review.

It seems to have quite a range in habitat, as I have in my collection two female specimens collected by the late F. G. Schaupp at Shovel Mt., Texas.

Haliplus subguttatus new species.

Oval, convex, ferruginous.

Size: length 4–4¼, width 2½–2¾ mm.

Head evenly, finely, closely, but not deeply, punctate, except a narrow subbasal space impunctate; a narrow blackish or infuscate space at base between the eyes; antennæ color of head.

Pronotum finely and unevenly punctured from side to side apically, a double row of deep black punctures at base, with a rather broad discal space nearly impunctate; a more or less extended deeply infuscate area at apex.

The anterior of the double row of basal punctures is the shorter and composed of smaller, irregularly placed ones, while in the posterior row they are regularly placed and much enlarged towards the side margins.

Elytra oval, widest at middle, gradually rounded to exterior angle and with the apices slightly oblique, not sinuate, interior angles obtuse; striæ composed of deep blackened punctures, largest at base and gradually diminishing to apex; sutural interspace with a single row of small punctures closely and evenly placed, the remaining intervals having similar ones more widely separated; maculate with elongate spots or dashes of black situated as follows: one nearly touching the base between the third and fourth striæ, one subhumeral between the fifth and sixth, one obliquely below this between the third and fourth, three below this last, placed horizontally, the inner extending in a patch from suture to second stria, the middle between the fifth and sixth and the outer between the seventh and eighth, below these four more subapical between the second and third, fourth and fifth, sixth and seventh, this last very short, and a patch from eighth to lateral margin; suture very narrowly black from base to apex, base immaculate. Underside of body ferruginous with the joints of legs and posterior margins of abdominal segments infuscate.

Prosternal process flat, scarcely wider at base than apex, somewhat constricted before front coxæ, apex finely margined, with deep, closely placed punctures diminishing towards the apex. Mid-metasternum almost flat, without margins, not tumid in front, sometimes with a slight depression at center; punctuation the same as that of the prosternum with the usual smooth space at center. Hind coxæ with moderate-sized, deep punctures evenly placed; apices broadly rounded exteriorly, nearly truncate from middle to suture.

Front and middle tarsi of male with the joints not much shorter than those of the female, slightly compressed and quite evidently, though not strongly, pedunculate.

Male and female types from Tyngsboro, Mass. (Fredk. Blanchard) in my collection.

Dr. Leconte separated this species under the above name in manuscript, but never published the description, being perhaps deterred by Mr. Crotch's criticism that it was only a dark form of *cribrarius*. It is unquestionably distinct from that species.

Twenty-eight examples before me vary little in form, punctuation or structural characters, but there is a wide range in maculation, the tendency being a reduction in the length of the spots or a fading away even to the complete obliteration of some of them.

In the male type the extreme intensity of marking is illustrated, while in the female type the spots are all reduced, the basal entirely wanting, and of the three submedian ones the inner is not coalescent with the suture and the outer has entirely disappeared. I have, how-

ever, a female almost identical in markings with the male and *vice versa*. Other localities than that of the types from which I have seen specimens are Antigonish, N. S. (J. M. Swaine), Montreal, Que. (Chagnon), Frazer Valley, B. C. (Weidt), Aweme (Criddle), Peachland, Husavick and Winnipeg (Wallis), Manitoba.

Haliplus gracilis new species.

Form oval, narrow, sides nearly parallel, color pale testaceous.

Size: length 3½–4, width 2–2½ mm.

Head punctured with extremely fine, shallow, scattered punctures; eyes large and rather prominent; antennæ color of head.

Pronotum in front with deep small punctures not closely placed, base with confused rows of coarser punctures, disc smooth; sides quite strongly compressed apically behind the eyes and lightly impressed each side of middle at base; side margins wider than near allies; apex slightly, if at all, infuscate.

Elytra widest just below the humeri, very little wider than at base; sides nearly parallel and somewhat flattened; apices oblique and slightly sinuate, sutural angle acute; striæ composed of moderately large, shallow, brown punctures, very much diminished apically and laterally; maculate with pale brown spots placed as follows: two antemedian placed obliquely, one submedian and two below this one subapical, these spots being at no time prominent, frequently evanescent. Under surface and legs bright fulvous.

Prosternal process flat, sides parallel to front coxæ, greatly constricted beyond them and then widely excurved, not steeply declivous in front but broadly arched; without side or apical margins and unevenly punctured with different sized punctures, coarsest near base.

Mid-metasternum broadly impressed behind middle coxæ, not tumid in front, finely but distinctly margined on the sides and with a few scattered punctures in front and at the sides. Usually there is a shallow pit, more or less distinct, placed centrally upon the anterior suture of antecoxal piece.

Hind coxæ with deep, medium-sized punctures evenly placed; apices broadly rounded from exterior angle to apex thence feebly sinuate to suture, where the angles are acute and slightly produced.

Male front and middle tarsi thickened, but not at all pedunculate.

Male and female types from Corvallis, Oreg. (A. R. Woodcock), in my collection.

All the specimens I have seen, about one hundred and fifty, are from the same locality and do not vary except as indicated in the description.

This species is the most slender in the *cribrarius* group.

Haliplus cylindricus new species.

Elongate, regularly oval, convex, color pale olive yellow.

Size: length 4½ mm., width 2¼ mm.

Head finely, evenly, lightly punctured except at vertex; eyes large, round and prominent; antennæ color of head.

Pronotum with fine deep punctures apically, extending back to disc; disc with a few scattered punctures; base with a double row of coarse black punctures; a distinct median depression across disc basally.

Elytra without markings; widest at shoulders, nearly parallel at sides, with the apices obliquely truncate and angles obtuse; striæ composed of moderate-sized, deep, blackened punctures not larger than those at base of pronotum and gradually reduced in size almost from base to apex; striæ not confused apically. Under side and legs a dull or smoky yellow.

Prosternal process widest at base, somewhat, not sharply, constricted before the front coxæ, evenly, deeply, closely punctate; sides and apex finely but distinctly margined. Mid-metasternum nearly flat, sparsely punctate, without margins and with a round pit at center.

Hind coxæ with moderately deep, evenly placed, medium-sized punctures; apices evenly rounded to suture where the angle is nearly rectangular.

Male front and middle tarsi a little thickened and feebly pedunculate.

Four specimens from Twin Lakes, California, were sent me by Mr. Ralph Hopping, to whom I am much indebted for a gift of the types ♂ and ♀, which are in my collection.

Haliplus rugosus new species.

Broadly oval, widest at middle, not strongly convex, rufous.

Size: length 4 mm., width 2½ mm.

Head finely, evenly not deeply punctate except a small space at vertex impunctate; eyes large, round, well separated, rather prominent; antennæ rufous.

Pronotum finely, evenly, densely punctate; distinctly impressed at base before the scutellum; a narrow median line at apex infuscate.

Elytra uniformly rufous, except a small central patch of testaceous extending from the sixth stria to lateral margin; broad, nearly flat dorsally, with the sides gradually rounded and with the lateral margins serrulate to the exterior apical angle; apices oblique and feebly sinuate with the sutural angle obtuse; strial punctures moderately large and deep, those of the sixth to tenth being largest and quite distinctly separated while those of the first five are confused and confluent giving the whole basal area between the humeri, and extending fully one quarter of the distance to apices, a decidedly rugose appearance; punctures strongly diminished apically; fine punctures of the dorsal interspaces numerous, crowded and mixed up with those of the striæ.

Under surface nearly unicolorous with the upper.

Prosternum with the sides slightly constricted from base to front coxæ and thence strongly excurved to apex, which is one third wider than base; sides with heavy, thick margins, apex less thickly margined; slightly convex laterally, strongly arched apically and closely, finely, deeply punctured between the margins.

Mid-metasternum with thickened margins continuing in alignment with those of the prosternum and reaching the suture of antecoxal piece; interspace nearly flat and finely punctured.

Hind coxal plates with moderately fine, evenly placed, deep punctures; apices broadly, separately rounded.

Abdominal segments distinctly margined posteriorly and with the usual rows of punctures very fine, almost obsolete.

Male front and middle tarsi thickened and slightly pedunculate.

The unique type has been in my collection for many years and has no more definite locality label than "California."

Another specimen in the Leconte collection is labelled "Mineri" Cr. Mss.

I do not see how this very distinct species can be confused with any other.

Haliplus tumidus Lec.

This species varies greatly in color and markings. In the twenty-eight specimens before me there are all grades of maculation and color from testaceous with a narrow sutural stripe and small central blotch light brown, to a very dark, almost entirely piceous, color, with the markings scarcely discernible. The most distinctly marked form I have seen may be thus described.

Color testaceous.

Pronotum broadly infuscate before and behind. Elytra with base, suture, a large central blotch joining an interior discal spot, a larger posterior spot a little exterior to the discal one, a subsutural, still more posterior joining suture, and an outer subapical spot piceous.

One character, apparently overlooked by Dr. Leconte, that at once distinguishes this species is that the elytra at the humeri are finely, distinctly asperate.

The elytral margins are distinctly serrate and the apices serrulate.

The hind coxal rings are rounded exteriorly, inflexed, inwardly sinuate and with the sutural angle acute and produced.

Dr. Leconte's description of the metasternum as being "with a deep square impression" is scarcely accurate. When a specimen is properly mounted from the side, so as to show the entire mid-metasternum, it will be found to have a deep impression each side, strongly margined exteriorly and with a more or less distinct short ridge in center. In spite of color variation the structural characters are so distinct that the species should be easily recognized.

All the specimens I have seen are from Texas, and nearly all from the one locality, Brownsville.

Haliplus concolor Lec.

This species is more oval in form than *tumidus* and of a deep ferruginous color.

In the six specimens before me, five being from San Diego, Cal. (Soltan), and one from Los Angeles, Calf. (Van Dyke), the size ranges from 2½ to 3½ mm. in length and from 1½ to 2¼ mm. in width.

Two specimens, a male and female, show indistinct maculation after the pattern of *tumidus,* the others are entirely unicolorous.

The pronotum is quite evenly, finely punctured and somewhat convex from apex to base, giving the disc a "full" appearance. The elytral striæ are not so deeply or coarsely punctate as in *tumidus;* the punctures very much finer towards the suture and apices and there is no sign of asperity at the humeri, but on the contrary only a few fine punctures appear at that point leaving them almost bald and shining; the side margins are serrulate, gradually rounded, and the apices feebly oblique.

The prosternal process is not sulcate, the sides being parallel for almost their entire length; sides and apex finely, sharply margined.

The mid-metasternum is deeply impressed each side, leaving a distinct short ridge between, with the margins very fine and nearly attaining the suture of antecoxal piece.

Hind coxal plates with small, deep punctures evenly placed and with the apices rounded to beyond the center, then slightly inflexed but scarcely sinuate, with the sutural angle rectangular but not produced.

In undertaking a re-description of this species Mr. Matheson has blundered in not recognizing the species before him, as was the case with *punctatus.*

His description, such as it is, does not agree with the type nor would my specimens fit into it.

My suspicions were aroused by his giving the locality of his specimen as Brownsville, Texas, the home of *tumidus,* while all the specimens of *concolor* I had seen were from California.

Writing to Prof. Wickham, who has the specimen described by

Mr. Matheson, he answers that after careful examination he determines it as undoubtedly *tumidus*.

It is hard to tell from Mr. Matheson's vague descriptions what he has before him, but from the cut on Plate V. I am inclined to think that his *mimeticus* may be *concolor*.

Haliplus confluentus new species.

Oval, polished, dark ferruginous.

Size: length 3 mm., width 1½ mm.

Head evenly punctured with small, rather deep, not closely placed punctures; narrow between the eyes, which are very large and oblong oval; antennæ color of head.

Pronotum finely, evenly punctured, those of the apex being as fine as those of the head and closely placed, while those of the basal portion are a little coarser and not so closely placed; lightly impressed at base and with a piceous patch extending from apex to base, broadening on base; sides ferruginous.

Elytra highly polished, broadest just behind the humeri, gradually narrowing to the apices, which are not strongly oblique, feebly sinuate, with the sutural angle almost rectangular; punctures of the striæ much coarser than those of the pronotum, shallow, well separated, finer apically but with the rows distinct and punctures not confused; intervals, except the sutural, with very fine punctures widely separated and lightly impressed; base and suture broadly piceous and with patches of the same color placed subhumerally, medianly, submedianly, anteapically and laterally, all more or less confluent, leaving small spots only of the ferruginous ground color showing; surface highly polished.

Under surface dark ferruginous and the punctuation, considering the size of the species, is very coarse and deep throughout.

Prosternal process with the sides parallel for nearly their entire length, slightly wider in front and strongly margined, especially towards the apex, with the apical margin evident; convex laterally with a few very fine punctures upon the convexity.

Mid-metasternum strongly margined; margins continuing in line with the prosternal ones, divergent apically, slightly thicker basally and nearly reaching the suture of antecoxal piece, with a few very fine punctures between them.

Hind coxal plates broadly rounded, slightly incurved interiorly, with the sutural angle sharp.

Abdominal segments with the usual rows of punctures deeply impressed.

Male front and middle tarsi with the joints thickened, not pedunculate.

In the female type the dark markings are not quite so much extended as in the male, more of the ground color appearing; but the markings are equally confluent, not reduced to spots.

Male and female types from Taylor Co., Fla. (Mr. W. S. Genung),

are in my collection. Other localities are Sanford and Jacksonville (Mr. Genung) and Tampa, Florida (U. S. Natl. Mus. Coll.).

This is quite a distinct species, smaller than either *tumidus* or *concolor*, and easily distinguished from *lewisii* and *borealis* by both color and punctuation. It has no thoracic impression, or plica, as have all the species in the *ruficollis* group, except *borealis*. The upper surface is exceptionally polished, and the extent of the very dark markings give it an almost black appearance.

Haliplus annulatus new species.

Oval, very small, rufous.

Size: length 2–2½ mm.; width 1¼–1¾ mm.

Head very finely, not deeply, punctured; eyes large; antennæ color of head.

Pronotum finely, densely punctured, scarcely less so on disc, impressed at base, slightly infuscate along the apical margin.

Elytra widest at about the middle, sides gradually rounded, apices rounded exteriorly and very feebly oblique to the sutural angle, which is rectangular; punctures of the striæ small, not deep, largest at the sides and gradually smaller to the sutural stria, but not strongly diminishing apically; punctures of the interspaces very minute, scarcely discernible; the markings consist of bars or bands of black placed on base, across the middle and at apex, of which the basal is narrowest, but not linear, the others broad and all extending nearly, if not quite, across the elytra from side margin to side margin, the middle being the most irregular of the three in outline.

Under surface rufous.

Prosternal ridge narrowest at base, gradually broadening to apex, sides and apex distinctly margined, slightly convex basally with a few scattered punctures.

Mid-metasternum narrowly impressed each side at base of side margins; side margins fine and nearly reaching the suture of antecoxal piece.

Hind coxal plates with fine, not deeply impressed, punctures which are coarser towards the apices; apices separately rounded, but with the sutural angle very sharp, almost produced.

Abdominal segments with the usual rows of punctures very fine.

Male tarsi thickened, slightly pedunculate, and with the claws noticeably long for so small a species.

Male and female types from Taylor Co., Florida (W. S. Genung), in my collection.

Distinct from any other species on account of its small size and peculiar markings. About one hundred and fifty specimens examined show very little variation, and the largest is not larger than the smallest specimen of *lewisii*. I have seen other localities from which

I have specimens and Jacksonville, Florida (W. S. Genung), and South Carolina (Wm. Jülich).

Haliplus lewisii Cr.

Until the discovery of *annulatus* this was our smallest species. The average size, however, is considerably larger than the latter and while the maculation varies to quite an extent it does not approach that of *annulatus*. The punctuation is different, as are other structural characters, and the fine but distinct denticulation to the apices of the elytra is entirely lacking in the latter. The fact, stated by Mr. Matheson, that the species is found in Wisconsin and Indiana is interesting, as all the specimens noted heretofore are from Texas.

Haliplus borealis Lec.

Mr. C. G. Thomson has written that in *ruficollis* and its European allies the second joint of the labial palpi is dilated inwardly from base to apex so that the inner apical angle is prominent. *Borealis* has this same form of labial palpi, which at once places it in the *ruficollis* group, in spite of the lack of a thoracic plica.

Haliplus blanchardi new species.

Oval, shining, fulvous.

Size: length 3 mm.; width 2 mm.

Head very finely, closely, evenly punctured throughout; broad between the eyes, which are round, not large and rather prominent; antennæ ferruginous.

Pronotum with scattered fine punctures, not coarser than those of the head, immaculate, narrowly infuscate at apex and impressed at base; plica at each side of base fine, moderately long and not deeply impressed.

Elytra broadest just behind the humeri, gradually narrowing to the exterior apical angle which is prominent, nearly angulate; apices strongly sinuate; strial punctures small, not deep or closely placed, somewhat diminished apically; base broadly black from suture nearly to lateral margins, a small black spot below the humeri, a large patch of black below this on the suture, another spot obliquely below the patch and two more subapical spots, the interior of which is sometimes confluent with the suture.

Under surface testaceous.

Prosternum rather narrow at base, gradually narrowing to beyond front coxæ, but not constricted, thence widening somewhat to apex; sides margined and with rather coarse scattered punctures on the interspace, which is nearly flat; apex not margined.

Mid-metasternum with the margins short and somewhat thickened, or tumid, basally; moderately deeply impressed between the margins.

Hind coxæ with the punctures small, shallow, evenly placed, and with the apices rounded exteriorly and only very little incurved, nearly truncate, from apex to suture.

Abdominal segments, except the last, with the punctures almost obsolete.

Male front and middle tarsal joints distinctly thickened, but not pedunculate.

Male and female types from Fairfield Co., Conn. (Roberts), are in my collection.

Other localities for the species are South Framingham, Mass. (Frost); Staten Island, N. Y. (Roberts); Louisiana (Wm. Jülich), and Rhode Island. Named for the late Frederick Blanchard who showed me a specimen sent him by Mr. Frost, the first I had seen.

From the form of the labial palpi this species belongs in the *ruficollis* group and is closely allied to it and *longulus,* but at once distinct and easily separated by the strongly sinuate apices of the elytra, being nearer to *borealis* in that respect. It is not so elongate as *longulus,* resembling closely in form *ruficollis,* but is more shining and with the spots more confluent than in the latter.

Haliplus pallidus new species.

Oval, rounded, pale greenish yellow.

Size: length 3 mm.; width 2 mm.

Head finely, evenly punctate, immaculate; eyes round, well separated; antennæ color of head.

Pronotum finely punctured, except a narrow space across disc; punctures not larger than those of head, a narrow collar of slightly darker color across apex, a short rather deep plica at base each side.

Elytra broadest just behind the humeri, very gradually rounded, apices scarcely oblique; strial punctures small and shallow, not crowded, of a deeper shade than the ground color, except those of the 9th and 10th striæ, which are much finer, more or less confused and not darkened; immaculate, except that in some specimens small clusters of darker punctures give an indefinite suggestion of spots; a row of closely placed fine punctures on sutural interspace, other interspaces with the very fine punctures widely separated.

Under surface and legs color of upper.

Prosternum widest at base but not broad, gradually narrowing to front coxæ and continuing with the sides parallel to apex; narrowly channeled from base to apex, not distinctly punctate but having a roughened appearance.

Mid-metasternum depressed between the middle coxæ, margins very short, somewhat tumid basally.

Hind coxal plates finely, evenly, not deeply punctured; apices rounded exteriorly and very little incurved towards the suture where the angle is obtuse.

Abdominal segments with the rows of punctures very fine.

Male front and middle tarsi thickened, not pedunculate.

Male and female types from Corvallis, Oreg. (A. R. Woodcock), are in my collection. Other localities from which I have specimens are Laramie, Wyo. (H. F. Wickman); Frazer Valley, B. C. (R. Weidt); Arcata, Humboldt Co., Cal. (Dr. Van Dyke), and Garland, Colo. (U. S. Natl. Mus.).

Haliplus strigatus new species.

Oval, elongate, light fulvous.

Size: length 3–3½ mm.; width 1½–2 mm.

Head finely, sparsely punctured, broad between the eyes, infuscate at base, the infuscation in some specimens extending down below the apex of the eyes; eyes oblong oval, rather large and prominent.

Pronotum immaculate, light fulvous, sparsely, finely punctured even at base and apex, a broad space across the disc impunctate; basal plica deeply impressed, a little longer than one quarter the depth of the pronotum.

Elytra scarcely wider at humeri than at middle, sides nearly parallel, compressed; apices not strongly, but evidently, sinuate with the sutural angle acute; striæ composed of fine, deep, closely placed, blackened punctures; strigate; intervals, including the sutural, with the punctures obsolete.

Under surface and legs pale yellow.

Prosternal process flat, without margins, scarcely broader at base than between the front coxæ, beyond which it is strongly constricted and very little excurved to apex.

Mid-metasternum nearly flat, lightly impressed and finely punctured each side.

Hind coxal plates with the punctures moderate in size, well separated and very shallow; apices broadly, separately rounded.

Male front and middle tarsi thickened, evidently pedunculate, especially so on the middle tarsi.

Male and female types from Treesbank, Manitoba (J. B. Wallis), in my collection. Other localities from which I have seen specimens are Stony Mountain (J. B. Wallis) and Aweme (N. Criddle), Manitoba; Frazer Valley, B. C. (G. Weidt), and Laramie, Wyo. (H. F. Wickham). In a series from Aweme, Man., sent me by Mr. Norman Criddle, the specimens are a little larger and the characters of the under body somewhat exaggerated, but it is not otherwise distinct.

The six species, *borealis, rufícollis, blanchardi, pallidus, strigatus* and *longulus* form a distinct group by having the second joint of the labial palpi dilated inwardly from base to apex so that the inner apical angle is prominent, as pointed out in the case of *rufícollis* by

Mr. C. G. Thomson. All, with the exception of *borealis,* also have a thoracic fold, or plica, as a distinctive character.

While the species are all small and much alike in general appearance they should not be hard to separate. *Borealis* may at once be recognized by the lack of any plica on base of pronotum; *longulus* is the most elongate, noticeably so, narrow and highly polished and the thoracic plica is distinctly longer than in any of the other species; *strigatus* is distinguished by the lack of any maculation, the truly strigate elytra, caused by the deep, blackened, closely placed punctures, with their compressed, almost parallel sides.

Ruficollis, blanchardi and *pallidus* are proportionately stouter than the others, and of these three *blanchardi* may be recognized by the strong sinuation of the apices of the elytra and acute exterior angle, which characters are fully as pronounced as in *borealis; pallidus* by the lack of any *black* markings, even on the base of the elytra, and the flat prosternal process; *ruficollis* by its black maculation, usually distinct, apices of elytra rounded, prosternal process depressed, or channelled, lengthwise. In the hundreds of specimens of *ruficollis* examined I have never seen a specimen, even when the usual maculation has almost completely disappeared, that did not have at least a narrow black basal margin. If doubt exists after separating by these general characteristics a reference to the full descriptions should at once dispel it.

PELTODYTES Regimbart.

It is with a strong feeling of rebellion in my heart that I adopt the generic name *Peltodytes* of Regimbart for that of the well-known and long-established *Cnemidotus* of Erichson. However, Illiger having undoubtedly made this name a synonym of the *Haliplus* of Latreille it could not be used, under the accepted rules, and we lose one more name long familiar to all students and collectors of aquatic Coleoptera.

Peltodytes callosus Leconte.

In addition to characters mentioned by other writers I find that in this species the mid-metasternum is deeply depressed between the middle coxæ so as to leave the margins at base decidedly tumid, while behind the coxæ they are fine, but quite distinct, and nearly

reach the suture of the antecoxal piece; the space between the margins is impunctate and shining. The posterior coxal plates are broadly, separately rounded, without any appearance of angulation, and with the punctures large but very shallow and indistinct. The apices of the elytra are not rounded, as stated by Mr. Matheson, but obliquely truncate and evidently sinuate.

The males may be separated from the females by the thickening of the joints of the front and middle tarsi, especially the first and second joints of those of the middle legs.

It is probably pretty well known that the females have the elytra tuberculate as well as the males and are not, as supposed by Mr. Crotch, "very hard to separate from *12-punctatus.*"

The species has quite a range of habitat and I have specimens from Provo (H. Soltau), Virgin River (G. Weidt), and Mill Creek (Hub. & Sz), Utah; Tacoma, Wash.; Corvallis, Oreg. (A. R. Woodcock); Peachland (J. B. Wallis), and Frazer Valley (A. Weidt), Brit. Col.; Alburquerque, N. Mex. (H. F. Wickham), and from nearly all parts of California.

Peltodytes simplex Leconte.

In this species the mid-metasternum is not deeply impressed between the middle coxæ, as is the case in *callosus,* but nearly flat, lightly impressed each side behind the coxæ and with the margins short, hardly reaching half way to the margin of antecoxal piece, smooth and shining between the margins with a few deep punctures at their extremities. The hind coxal plates are rather more deeply punctate than in *callosus* and the apices are subangulate.

Last abdominal segment smooth and shining.

The under plane of the body is rather flat, not strongly arched longitudinally at the mid-metasternum, or "chicken-breasted," as in *edentulus* and some other species.

I should not call the prosternal process "steeply declivous in front," but strongly arched almost from base to gula without distinct apex or limiting margin. The thighs of posterior legs are dark brown in color, and the males have the joints of the front and middle tarsi thickened, but not pedunculate. All the specimens I have seen are from San Diego, Los Angeles, Campo and San Bernardino, California.

Peltodytes dispersus new species.

Oval, elongate, greenish yellow.

Size: length 3¼–3¾ mm.; width 2–2½ mm.

Head finely, evenly punctured, narrow between the eyes; eyes large, oval, not strongly convex; antennæ color of head.

Pronotum evenly punctured, except a small space at disc, those of the apex and sides less coarse and deep than those at base; punctures not blackened, and the usual black basal spots moderate in size.

Elytra broadest at middle, gradually rounded from base to exterior apical angle; apices truncate-sinuate with the sutural angle acute; striate with eleven rows of coarse, deep, blackened punctures diminishing, but not confused, apically, with a short basal stria between the third and fourth; the fourth stria is rather crowded, in some specimens, between the third and fifth but distinct, and the eleventh is placed close to the lateral margin; maculate with six small, rather faint, black spots of which the first three form a triangle which has the apical spot placed at the base of the short extra stria and the other two subsutural and sublateral at the median line, with the second three forming a smaller subapical triangle; suture narrowly black and the base with a very narrow dark border and a row of large, deep punctures extending from suture to humerus.

Under side and legs ferruginous in color.

Prosternal process broad at base, finely but distinctly margined laterally, shallowly concave or channeled, rapidly narrowed to front coxæ where it is strongly constricted, and thence widening a little to apex; apex defined by a fine outwardly convex margin; rugosely punctured between the margins.

Mid-metasternum not strongly depressed between the middle coxæ, slightly impressed each side below them, margins fine and short, intermediate space shining and with a few scattered punctures near the margins.

Hind coxal plates finely, evenly and not deeply punctured; apices rounded and faintly subangulate at middle with the sutural angle rectangular.

Last abdominal segment smooth, shining; hind femora very dark brown.

Male front and middle tarsi with the joints very little thickened, not at all produced.

Male and female types from Tucson, Arizona (Geo. D. Hulst), are in my collection.

Other specimens before me are from Prescott (Hulst), Riverside (H. F. Wickham), Huachuca Mts. (H. G. Barber), Hot Springs, Brt. Angel, Col. Canyon (H. S. Barber), and other localities in Arizona; Provo, Utah (H. Soltau).

The species is nearest to *simplex,* but at once distinct by its lighter color, more narrow form, much finer punctuation, the complete fourth stria and the narrower prosternal process with its evident apical margin.

Peltodytes muticus Lec.

According to my view this species, and all our other species of *Peltodytes,* has eleven, not ten, striæ on each elytron.

I do not know why the fourth stria should be left out of the count because it is interrupted, any more than the tenth, or eleventh as I count, because it is placed so close to the lateral margin as to actually crowd upon it, as is not infrequently the case.

This interruption of the fourth stria has apparently been caused by the strong sinuation, or incurving, of the fifth stria and I have specimens, in *muticus* for example, in which the fifth stria is not so strongly sinuate as usual and here the fourth is complete, with no punctures missing from the fifth.

As I count them we have a genus composed of species with the elytra eleven striate, not one composed of species with the elytra with either nine, ten or eleven striæ, with parts of striæ, or extra striæ, to be accounted for. *Muticus* should not be hard to recognize, and is quite distinct from *floridensis oppositus* and *shermani* which are mixed with it in some collections. The punctures of the striæ on the basal half of the elytra are strikingly coarse and deep, while those of the lower half become smaller and smaller and much confused as they approach the apex.

The apices are not rounded, but truncate, slightly oblique and feebly sinuate. The six spots on the elytra represent two triangles in the upper of which the apical spot is weak, the lateral distinct and the inner large and coalescent on the suture submedianly forming an irregular patch, while in the lower, subapical triangle the spots are small and more or less indistinct, but not coalescent.

There is no subhumeral spot and the suture is very narrowly margined with black except where it expands to coalesce with the submedian spot.

It is not strongly arched, or "chicken-breasted," underneath the body.

The mid-metasternum is nearly flat, very lightly impressed each side, with the margins fine, arcuate and nearly reaching suture of antecoxal piece.

Hind coxal plates with small evenly placed punctures, rounded behind and showing scarcely a trace of angulation.

Last abdominal segment smooth, shining. Posterior thighs dark brown, nearly black at the knees.

Male front and middle tarsal joints feebly thickened.

The subhumeral black patch on the suture of elytra, with the other markings weak, is quite distinctive.

Peltodytes oppositus new species.

Oval, fulvous, shining, spots distinct.

Size: length 3½–4 mm.; width 2–2¾ mm.

Head finely punctured, narrow between the eyes, vertex smooth; antennæ color of head.

Pronotum evenly, rather finely punctured, more sparsely between the basal spots, with a few coarse punctures on the spots and along the base towards the side margins.

Elytra broadest near the middle, gradually rounded, apices obliquely truncate and sinuate; striæ composed of mixed punctures, those of the inner three, and interrupted fourth, being much smaller and less deeply impressed than those of the middle and lateral rows; the punctures diminish in size below the median line but the rows are not confused; the maculation consists of seven large, distinct spots, one humeral, one sub-basal, two median the outer of which is sub-lateral and the inner coalescent with the sutural margin, three subapical in a triangle and not confluent; black basal margin narrow except just below the spots on pronotum, where it extends downwards somewhat upon the elytra; the suture is broadly margined with black, reaching the first stria, from base to coalescent median spot and from thence much more narrowly to the blackened apex.

Under side bright fulvous.

Prosternum broadest at base, narrowing gradually to front coxæ and only a little widened at apex; sides rather thickly, and apex finely margined, not channeled but rather full between the margins and closely, evenly punctured.

Mid-metasternum nearly flat, margined, lightly impressed each side below the coxæ, evenly, finely punctured between the margins except a limited central spot; the margins are weakly arcuate at the coxæ and extend about two thirds the distance to the antecoxal piece.

Hind coxæ evenly, finely punctured; apices distinctly angulate; posterior thighs very dark brown, nearly black, and the last abdominal segment dull, distinctly rugose.

Male front and middle tarsi with the joints thickened, slightly produced.

Male and female types from Jacksonville, Florida (W. S. Genung), in my collection. Although somewhat similar in markings to the *floridensis* of Matheson, and taken with it by Mr. Genung, I believe this species to be distinct. A special characteristic of *floridensis* is the brevity of the rows of coarse punctures on the elytra

which are replaced at, or just behind, the middle by more confused rows of fine punctures. In the present species they are normal, the series of coarse punctures extending farther back. Furthermore the anal segment is distinctly rugose and dull instead of shining; the spots distinct, not confluent, and consequently decidedly more of the ground color appears. The prosternal process is broader at base and the punctures finer and more extended on both it and the metasternum.

In many respects it is the opposite of *floridensis*.

Peltodytes shermani new species.

Oval, testaceous, spots large and distinct.

Size: length 3½–4 mm.; width 2¼–2½ mm.

Head very finely, closely, not deeply punctate; punctures stronger between the eyes than on vertex; narrow between the eyes; eyes large, round, prominent; antennæ somewhat darker than head.

Pronotum with the punctures small, evenly distributed, slightly larger basally; basal black spots moderate in size.

Elytra slightly wider at middle than at the shoulders, very gradually narrowed to the exterior apical angle; apices nearly truncate, feebly oblique and sinuate, with the exterior angle evident and the interior rectangular; the eleven striæ, of which the fourth is broken antemedianly, are composed of moderately coarse punctures not greatly reduced in size until near the apex, not confused; maculate with seven large black spots placed as follows: one subhumeral laterally, one antemedian on the fourth stria, two below this one sublateral and median, the latter touching the blackened suture, three below these two, subapical, forming a small triangle; base and suture margined with black, the former narrowly and the latter broadly from base to median spots and then narrowly to the usual black apex.

Under side light testaceous; legs light testaceous with the joints and entire posterior femora black.

Prosternal process moderately broad at base, gradually narrowing to front coxæ, where they are feebly constricted, and thence only slightly broadening to apex; apex and sides distinctly, though not thickly, margined, evenly, confluently punctured between the margins.

Mid-metasternum broad between the margins, nearly flat, confluently punctured at base and sides, not impressed; margins distinct, quite strongly arched at the middle coxæ, parallel below them and reaching two thirds the distance to the suture of antecoxal piece.

Hind coxal plates evenly, finely, shallowly punctured, apices broadly rounded with scarcely a trace of angulation.

Last abdominal segment somewhat shining, finely rugose on apical half.

Male with the joints of the front tarsi very little modified, but the middle tarsi have the first and second joints remarkably produced with the third joint simple.

Male and female types from Staten Island, N. Y. (Roberts), in my collection.

Other localities from which I have seen specimens are Cambridge (U. S. National Mus.) and Tyngsboro (F. Blanchard), Mass.; Fairfield Co., Conn. (Roberts); Camden Co., N. J., and Washington, D. C.

Named for my very good friend and enthusiastic co-worker in the Dytiscidæ, Mr. John D. Sherman, Jr.

The presence of the subhumeral spot at once separates this species from *muticus,* and the remarkable production of the joints of the middle tarsi in the male distinguishes it from any of those species having the posterior femora black or unicolorous.

Peltodytes sexmaculatus n. sp.

Oval, greenish yellow, spots round, well separated.

Size: length 3½ mm.; width 2½ mm.

Head narrow between the eyes; eyes large, round, prominent; antennæ pale yellow; finely, evenly punctured with the punctures slightly finer on vertex.

Pronotum finely, evenly punctured except a small discal space impunctate; punctures scarcely larger than those of the head with a few coarser ones placed in the small black basal spots.

Elytra elongate oval, eleven striate, with the fourth stria interrupted antemedianly; apices, viewed from above, subsulcate the exterior angle being quite sharp and slightly produced with the interior rectangular; striæ composed of coarse punctures, blackened, except those of the 10th and 11th striæ, gradually reduced in size towards the apex, but not confused; maculate with six round spots on each elytron, moderate in size and placed as follows: one antemedian, two below this one at about the median line, the exterior sublateral and the interior subsutural, three below these forming a small triangle; base and suture narrowly margined with black, from suture to humerus and from base to apex.

Under side color of upper.

Prosternal process broadest at base, strongly constricted just beyond the front coxæ, very little broader at apex than at point of constriction, margined at the sides and apex, the side margin basally being somewhat thickened; confluently punctured and wrinkled between the margins.

Mid-metasternum margined, slightly impressed along the margins interiorly, margins nearly parallel and somewhat thickened between the middle coxæ, confluently punctured at base and with a few fine punctures near the margins.

Hind coxal wings with small, evenly placed, not deep punctures; apices evidently subangulate.

Posterior leg with the femora dark brown basally, deepening to almost black apically, and with the apex of tibia black.

Last abdominal segment shining, very finely rugose.

Male front and middle tarsi with the first and second joints slightly thickened and feebly produced.

Male and female types from Covington, La. (George Coverdale), are in my collection.

Other localities from which I have seen specimens are Galena, Kansas (E. Crumb); Brownsville, Tex. (H. F. Wickham); Missouri, Texas and Mass. (U. S. Natl. Mus.).

Looking at this species superficially it may be separated from the other species with dark or black hind femora by the maculation. It has no median black patch on the suture, as does *muticus*, and is separated from *floridensis, shermani* and *pedunculatus* by the lack of any subhumeral spot and the narrow, black sutural margin, occupying only half the space between the suture and first stria, and not wider basally than apically or touching the median spot.

Peltodytes tortulosus new species.

Broadly oval, greenish yellow, hump-backed.

Size: length 4½–5 mm.; width 2¾–3¼ mm.

Head broad between the eyes, finely, evenly punctured, a smooth space before vertex, vertex more or less infuscate: eyes round, not large, prominent; antennæ light yellow.

Pronotum evenly, not closely punctured with small punctures on the apical half and sides, a few coarser ones on the base and in the rather large basal black spots; a deep impression across the base between the spots.

Elytra broadest at the shoulders, feebly narrowed to the exterior apical angle, strongly arched medianly and flattened basally so as to appear hump-backed; apices feebly sinuate-truncate with the angles broadly rounded; eleven striate, the fourth stria not interrupted; punctures of the striæ coarse basally, much reduced in size below the median line, confused apically by the interposition of fine punctures; punctures very black, closely placed, not infrequently confluent or irregularly placed; suture very narrowly black, a row of deep confluent punctures along the base from the suture arching down upon the fifth stria; no subhumeral spot and the usual six spots indistinct or illy defined.

Under side fulvous, strongly arched at the mid-metasternum, or "chicken-breasted."

Prosternal process narrow at base, quite strongly constricted just beyond the front coxæ, gradually widening to apex, which is about two thirds the width of base; sides and apex finely margined, flat basally and concave at and beyond the point of constriction; not closely punctured.

Mid-metasternum slightly tumid each side at base, impressed each side behind the middle coxæ, finely margined for half the distance to the antecoxal

piece; interspace smooth, shining with a few punctures at base and below the margins.

Hind coxal plates with small, evenly placed, not deep punctures; apices rounded, feebly subangulate when viewed from the side.

Posterior legs with the thighs pale, color of under side, with the knees, and apex of tibia, darker.

Last abdominal segment shining, very finely rugose.

Male with the tarsi of front and middle legs thickened, but not produced.

Male and female types from Winnipeg Beach, Manitoba (J. B. Wallis), are in my collection. Also taken by Mr. N. Criddle at Aweme, Man. Our largest species and at a glance distinct from any other so far known.

The very black, closely placed punctures give it a very dark appearance.

Its form places it near the *callosus* of Leconte.

Peltodytes lengi new species.

Oblong oval, greenish yellow, spots moderate in size.

Size: length 4 mm.; width 2½ mm.

Head narrow and finely punctate between the eyes, vertex broadly impunctate; eyes large, broadly oval; antennæ color of head.

Pronotum finely, closely punctured apically, more coarsely and sparsely basally and at the sides; basal spots large and coarsely punctured.

Elytra broadest at shoulders, gradually narrowing to the exterior apical angle; apices feebly sulcate; eleven striate with the fourth greatly interrupted; punctures of striæ coarse and deep, those of the first and second smaller, rows distinct to near apex where there are three or four rows of small punctures placed horizontally, punctures blackened; maculate with six spots moderate in size and forming the usual two triangles with the median spot entirely free from the narrow black suture; base narrowly black to the humerus, with no evidence of a subhumeral spot or black dash.

Under side and legs yellow.

Prosternal process broad at base, strongly constricted between the anterior coxæ; apex half as broad as at base; sides and apex margined, margin thickened on basal half, somewhat convex between the margins and confluently punctured.

Mid-metasternum arched, broad, margined; margins somewhat thickened, or tumid, at the middle coxæ and a little convergent behind, extending more than half way to the suture of antecoxal piece; a few fine punctures between the margins.

Posterior coxal plates with numerous small, shallow punctures; apices feebly subangulate.

Posterior femora black basally and at the knees with a broad yellow band between.

Last abdominal segment smooth, polished.

Male front and middle tarsi with the joints thickened, the first and second being feebly produced.

Male and female types, from Staten Island, N. Y., are in my collection.

Named for my friend and associate of many years, Mr. Charles W. Leng, who was acting as my guide to the haunts of *Bidessus flavicollis* when the fourteen specimens before me were taken. In addition to the above I have seen a single specimen, taken at Chambersburg, Pa., by Mr. J. D. Sherman, Jr. The species is distinct from *12-punctatus* by its coarser elytral punctuation, the lack of any subhumeral spot, or dash of black, the scarcely subangulate apices of the coxal plates, which are distinctly angulate, or produced, in *12-punctatus,* and the much broader yellow band on the hind femora. From *edentulus* it is at once separated by the lack of a black collar on vertex of head and the structure of the under side of the body, as well as coloration.

These two are the only other species known with yellow-banded hind femora.

Peltodytes pedunculatus Blatchley.

I have never seen authentic specimens of this species and the author gives little else than maculation, as compared with *muticus,* to define it.

Specimens of a species from Covington, La. (Mr. Coverdale), separated by me as *pedunculatus,* have the sutural margin broad before the median spot, occupying the whole of the sutural interval, and narrow below it. While the median spot may not perhaps be called coalescent with the sutural border it touches the margin, and there is a subhumeral spot.

The apices of the elytra are feebly sinuate and slightly oblique. The apices of hind coxal plates are subangulate and the last abdominal segment smooth and shining. The posterior femora is very dark brown. The prosternal process is feebly sulcate, not greatly constricted.

The species is distinct from *shermani,* which is the *pedunculatus* of my manuscript referred to by Mr. Blatchley, and also from *muticus* and *sexmaculatus.*

From Mr. Blatchley's definition of his species in his table I am

inclined to think he had two species before him in making his synopsis of characteristics, perhaps *sexmaculatus* and his own. A single specimen each from "Kansas" and Detroit, Mich., in the U. S. Natl. Mus. collections, agree with the above-described specimens from Covington, La.

Peltodytes littoralis Matheson.

A very distinct species and easily separated from any other of our species by the uniformly pale posterior femora, its light yellow color and small but distinct spots on the elytra. The basal spots on the pronotum are very small and do not touch the base in any of the specimens I have seen.

A dozen specimens are before me from Kansas and Texas.

Peltodytes festivus Wehnke.

This pretty little species is represented in the U. S. Natl. Museum Collections. A careful examination shows the fourth stria to be very broadly interrupted and the lateral one placed almost upon the margin. They are no more broadly interrupted, or closer to the margin, than in some of our other species and, counting them, the species has eleven striæ instead of nine, as described by Mr. Wehnke.

Peltodytes duodecempunctatus Say.

In this species, as recognized by Aubé, Leconte and Crotch, the fourth elytral stria is very greatly interrupted. The strial punctures of the elytra are coarse, except those of the first and second, and very much diminished from about the median line to the apices. The apices are sulcate, though not strongly so. The maculation consists of six spots, placed as usual, and there is a black subhumeral dash almost upon the lateral margin. This dash of black is usually quite distinct, but I have seen specimens where it is represented by two or three very deeply blackened punctures only. The suture is narrowly margined with black and the median spot free. I have seen a few specimens in which the black sutural border broadens out somewhat towards the base, with the median spot barely touching it. The margins of the prosternal process are rather thick, both lateral and apical, and the constriction strong. The mid-metasternum has the margins thick and short, not reaching more than half way to the antecoxal piece, arched between the middle coxæ and somewhat con-

vergent apically. The apices of the posterior coxal wings are strongly angulate, more so than in *edentulus,* and the hind femora ringed with yellow before the knees. The joints of the front and middle tarsi in the males are very little modified, yet sufficiently so to at once separate them from the females.

Peltodytes edentulus Leconte.

This species is so well known by the black collar on the base of head that comment is scarcely necessary. I may state, however, that the species has no subhumeral spot, or dash of black; that the apices of elytra are decidedly sulcate, more so than in *12-punctatus,* and while the apices of the hind coxal plates are evidently angulate they are not so strongly so as in the above. It is one of the three species with the yellow band before the knees on the posterior femora.

The tarsal joints of the front and middle legs are thickened and slightly produced at apices in the males.

I have seen specimens with the head so much retracted as to completely conceal the black collar and, for the moment, disconcert one.

I have specimens from as far north as Treesbank and Winnipeg, Manitoba, collected by Mr. J. B. Wallis.

While I have indicated groups into which the species of *Haliplus* more or less naturally fall, and have given comparative characters by which to separate those in the different groups, I have not undertaken to make a table as I have not recognized three of Mr. Matheson's species.

A table of the species of *Peltodytes* follows.

Posterior femora entirely black or brown ..... 1.
Posterior femora black, ringed with yellow before the knees ..... 2.
Posterior femora pale, knees only darker ..... 3.
1. Elytra without subhumeral spot, or dash of black ..... 4.
Elytra with a subhumeral spot, or dash of black ..... 5.
4. Elytra without distinct callosity, or tubercle ..... 6.
Elytra with a distinct callosity ..... *callosus.*
6. Apex of prosternal process distinctly margined ..... 7.
Apex of prosternal process not distinctly margined.....*simplex.*
7. Fourth stria incomplete, interrupted medianly ..... 8.
Fourth stria complete ..... *dispersus.*
8. Median spots coalescent on suture forming a black blotch ..... *muticus.*
Median spots free, not coalescent on suture .....*sexmaculatus.*
5. Sutural margin uneven, noticeably wider basally than apically ..... 9.
Sutural margin even, not wider basally than apically ..... *festivus.*

9. Last abdominal segment shining, polished ..... 10.
Last abdominal segment dull, rugose ..... 11.
10. Spots smaller, distinct, median barely touching sutural margin *pedunculatus.*
Spots larger, confluent, median distinctly coalescent with the sutural margin ..... *floridensis.*
11. Posterior coxal plates rounded at apex, scarcely perceptibly angulate; 1st and 2d joints of middle tarsi in male strongly produced *shermani.*
Posterior coxal plates angulate; 1st and 2d joints of middle tarsi in male thickened, but scarcely produced ..... *oppositus.*
2. Elytra without subhumeral spot or dash of black ..... 12.
Elytra with a more or less distinct spot or dash of black, hind coxal plates distinctly angulate at apex, produced .....*duodecempunctatus.*
12. Base of head with black collar, apices of posterior coxal plates angulate *edentulus.*
Base of head without black collar, apices of posterior coxal plates rounded ..... *lengi.*
3 Species smaller, bright, spots distinct, apices of posterior coxal plates subangulate ..... *littoralis.*
Species larger, dark, spots indistinct, hump-backed, apices of posterior coxal plates rounded ..... *tortulosus.*

THE PASSING OF THE HICKORY NUT?[1]

BY HENRY BIRD,

RYE, N. Y.

I want to depart from my usual theme on this occasion and call your attention to a coleopterous matter. I wish to say a word relating to *Scolytus quadrispinosus.*

Along about Columbus-Davis day, in other words October 12, or thereabouts, I begin to be fond of sitting by the open grate fire, cracking hickory nuts, and planning campaigns for the next year. But my pleasures of late have been marred by the lack of hickory nuts, and in so far as the supply is local, it would seem the time is near when we can say goodby to the hickories altogether. The weevil that attacks the nut I have always classed a despicable varmint, and have enjoyed sizzling many of them, but we are confronted of late years by another trouble, more important since it spells the death of the trees.

[1] Read before the New York Entomological Society, December 3, 1912.